

Carbapenemase-producing Enterobacterales (CPE)

INFORMATION FOR CLINICIANS & HEALTH PROFESSIONALS

Carbapenemase-producing Enterobacterales (CPE) are multidrug-resistant gram-negative bacteria that are resistant to most, or even all types of antibiotics.

Enterobacterales are a family of Gram-negative bacteria which are part of the normal gut flora. They can also spread outside the gut and cause serious infections such as bacteraemia, pneumonia, urinary tract and wound infections.

Carbapenems are a group of broad-spectrum antibiotics that are effective against most Gram-negative infections and are a last line of treatment for these infections.

Carbapenemase enzymes (e.g. KPC, NDM, IMP and VIM) produced by Enterobacterales can confer resistance to carbapenems and other important antibiotics, i.e. penicillins, cephalosporins, monobactams, aminoglycosides and fluoroquinolones.

Why are CPE a concern?

- CPE has caused a number of outbreaks in health care facilities nationally and overseas.
- CPE can have severe clinical consequences, infections are associated with high rates of morbidity, mortality, and burden to the health system.
- CPE are difficult to treat as these organisms are often resistant to many and sometimes all available antibiotics.
- Antibiotics used to treat CPE are associated with significant side effects.

CPE in Australia

Over the last decade CPE has spread throughout the world and are now endemic in healthcare facilities in many countries. Australia has not seen a significant number of CPE cases to date, however rates have been steadily rising in recent years. CPE is now considered as a major public health issue in Australia.

Who is at risk?

In Australia the major risk factor for acquiring CPE is overseas travel, especially when medical care or treatment in a health care facility is involved.

Additional risk factors are:

- Medical care, treatment or intervention in a healthcare facility or clinic overseas
- Prolonged hospitalisation
- Dialysis or chemotherapy in the previous 12 months
- Multiple or recent exposure to different antibiotics
- Indwelling medical devices
- Organ or stem cell transplant recipients
- Mechanical ventilation
- Admission to an intensive care unit
- Diabetes mellitus
- Prior VRE colonisation

How is CPE spread?

Patients who are colonised or infected with CPE can transmit CPE to other patients via direct or indirect contact.

- **Direct contact:** patient-to-patient contact (with contamination from a colonised/infected site)
- **Indirect contact:** could occur via a healthcare worker unwashed hands, inadequate cleaning of the environment (bed-rails, sinks, toilets) and/or contaminated shared equipment.

CPE Colonisation and Infection

CPE colonisation refers to the presence of the bacteria in/on a body surface without signs of infection. The primary site of CPE colonisation is usually the lower gastro-intestinal tract. Other potential sites for colonisation include the urinary system.

CPE infection refers to the invasion of a person's bodily tissues by the bacteria and their subsequent multiplication, resulting in disease-causing symptoms and the reaction of host tissues to these organisms and the toxins they produce.

Infection Prevention and Control Precautions

Infection prevention and control precautions are essential to minimise the transmission of CPE.

Standard precautions are the minimum infection prevention measures that apply to all patient care settings, regardless of suspected or confirmed infection status of the patient.

Contact precautions, when used with standard precautions, are designed to reduce the risk of transmission of microorganisms by direct and/or indirect contact

Contact precautions are required for all confirmed CPE cases and all suspected CPE cases. [Refer to Appendix 3 of CPE Guide.]

If there are insufficient single rooms available, patient placement should be discussed with the infection prevention and control team.

Standard precautions and contact precautions are outlined in the [NSW Health Infection Prevention and Control Policy](#) and the [NSW Infection Prevention and Control Handbook](#).

Antimicrobial Stewardship

Antimicrobial stewardship (AMS) is critically important to reduce the emergence and spread of antibiotic resistant pathogens such as CPE. It is essential that clinical practice ensures that use of antibiotics is consistent with Therapeutic Guidelines: Antibiotic, taking into consideration local susceptibility information.

Consult ID physicians and/or medical microbiologists for advice on managing antimicrobial therapy in patients with CPE infections.

Communication

On receipt of a positive result:

- Inform and educate the patient
- Liaise with your Infection Prevention and Control team
- Document in the patient medical record

- Communicate CPE status to any care providers and during referrals and transfers

Screening for CPE

An assessment should be conducted at admission to identify people who require screening for CPE.

1. Is the patient being transferred directly from a health care facility outside of Australia?
2. Has the patient received care in a health care facility including residential aged care outside of Australia in the last 12 months?
3. Has the patient been an inpatient in an Australian hospital or aged care home that has had an outbreak of CPE?
4. Is the patient a known CPE contact from another healthcare facility or are there any alerts in the patient record which indicate that the patient is a contact of a CPE case and has not had sufficient specimens taken to reasonably exclude CPE colonisation?
5. Patient deemed to require screening based on local risk assessment?

Additional Screening

Health services may choose to undertake CPE screening for additional patient groups, such as:

- Unit/ward considered to have a higher risk of transmission
- Unit/ward contains vulnerable patients at increased risk of acquiring CPE and developing severe illness.

Screening Specimen

Screening specimens should include rectal swab or stool, wound swabs, endotracheal tube aspirate (if relevant), and urine if the patient is catheterised.

Further Information

[Insert links to CPE Guide and Resources when available]

For more detailed guidance on prevention and management of CPE, please refer to:

- NSW Guideline & Toolkit for CPE

About the Healthcare Associated Infections (HAI) Program

The CEC's HAI program aims to assist local health districts and specialty health networks to improve systems to manage and monitor the prevention and control of HAIs. For further information, please visit <http://www.cec.health.nsw.gov.au>

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